Claims

1. A printed circuit wiring board design supporting device comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input part for inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction part for extracting the structure of said power planes and said ground planes;

a via hole extraction part for extracting via holes for interconnecting wiring extending at different levels to each other across said power planes and said ground planes;

a capacitor extraction part for extracting capacitors connected between said power planes and said ground planes;

a measurement part for measuring the distance between said via holes and said capacitors;

a distance comparison part for comparing the upper limit of a tolerable distance range between said via holes and said capacitors to measurement distance between said via holes and said capacitors, which is measured by said measurement part, with respect to the spacing between said power planes and said ground planes; and

a warning generation part for generating a warning if said

measurement distance is larger than the upper limit of said tolerable distance range.

2. The printed circuit wiring board design supporting device according to claim 1,

wherein the upper limit of said tolerable distance range is displayed as a table.

3. The printed circuit wiring board design supporting device according to claim 1,

wherein the upper limit of said tolerable distance range is displayed as a mathematical formula.

4. A printed circuit wiring board design supporting device comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input part for inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction part for extracting the structure of said power planes and said ground planes;

a via hole extraction part for extracting via holes for interconnecting wiring extending at different levels to each other

across said power planes and said ground planes;

a capacitor extraction part for extracting capacitors connected between said power planes and said ground planes;

a circle creation part for creating a circle with the upper limit of a tolerable distance range between said via holes and said capacitors as a radius centering around said via holes with respect to the spacing between said power planes and said ground planes;

a capacitor check part for checking to see if said capacitors are present within said circle; and

a warning generation part for generating a warning if the capacitors are not present within said circle.

5. A printed circuit wiring board design supporting device comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input part for inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction part for extracting the structure of said power planes and said ground planes;

a via hole extraction part for extracting via holes for interconnecting wiring extending at different levels to each other across said power planes and said ground planes;

a capacitor extraction part for extracting capacitors connected between said power planes and said ground planes;

a circle creation part for creating a circle with the upper limit of a tolerable distance range between said via holes and said capacitors as a radius centering around said via holes with respect to the spacing between said power planes and said ground planes;

a capacitor number check part for counting the number of said capacitors within said circle to compare the counted number thereof to the number of capacitors required for the upper limit of the tolerable distance range; and

a warning generation part for generating a warning if the capacitors within said circle do not meet the required number.

6. A printed circuit wiring board design supporting device comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input part for inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction part for extracting the structure of said power planes and said ground planes;

a power source pin extraction part for extracting power source pins for an integrated circuit mounted on said printed circuit board;

a capacitor extraction part for extracting capacitors connected between said power planes and said ground planes;

a measurement part for measuring the distance between said power source pins and said capacitors;

a distance comparison part for comparing measurement distance between said power source pins and said capacitors, which is measured by said measurement part, to the upper limit of a tolerable distance range between said power source pins and said capacitors with respect to the spacing between said power planes and said ground planes; and

a warning generation part for generating a warning if said measurement distance is larger than the upper limit of said tolerable distance range.

7. The printed circuit wiring board design supporting device according to claim 6,

wherein the upper limit of said tolerable distance range is displayed as a table.

8. The printed circuit wiring board design supporting device according to claim 6,

wherein the upper limit of said tolerable distance range is displayed as a mathematical formula.

9. A printed circuit wiring board design supporting device comprising, in order to design a printed circuit board including signal

wiring, power planes, and ground planes:

a layout data input part for inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction part for extracting the structure of said power planes and said ground planes;

a power source pin extraction part for extracting power source pins for an integrated circuit mounted on said printed circuit board;

a capacitor extraction part for extracting capacitors connected between said power planes and said ground planes;

a circle creation part for creating a circle with the upper limit of a tolerable distance range between said power source pins and said capacitors as a radius centering around said power source pins with respect to the spacing between said power planes and said ground planes;

a capacitor check part for checking to see if said capacitors are present within said circle; and

a warning generation part for generating a warning if the capacitors are not present within said circle.

10. A printed circuit wiring board design supporting device comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input part for inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction part for extracting the structure of said power planes and said ground planes;

a power source pin extraction part for extracting power source pins for an integrated circuit mounted on said printed circuit board;

a capacitor extraction part for extracting capacitors connected between said power planes and said ground planes;

a circle creation part for creating a circle with the upper limit of a tolerable distance range between said power source pins and said capacitors as a radius centering around said power source pins with respect to the spacing between said power planes and said ground planes;

a capacitor capacitance check part for checking to see if the total of capacitance values of all capacitors present within said circle exceeds a reference value; and

a warning generation part for generating a warning if the total of said capacitance values does not exceed said reference value.

11. A printed circuit wiring board design method comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a via hole extraction step of extracting via holes for interconnecting wiring extending at different levels to each other across said power planes and said ground planes;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a measurement step of measuring the distance between said via holes and said capacitors;

a distance comparison step of comparing the upper limit of a tolerable distance range between said via holes and said capacitors to measurement distance between said via holes and said capacitors, which is measured by said measurement part, with respect to the spacing between said power planes and said ground planes; and

a warning generation step of generating a warning if said measurement distance is larger than the upper limit of said tolerable distance range.

12. The printed circuit wiring board design method according to claim 11,

wherein the upper limit of said tolerable distance range is displayed as a table.

13. The printed circuit wiring board design method according to claim 11,

wherein the upper limit of said tolerable distance range is displayed as a mathematical formula.

14. A printed circuit wiring board design method comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a via hole extraction step of extracting via holes for interconnecting wiring extending at different levels to each other across said power planes and said ground planes;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a circle creation step of creating a circle with the upper limit of a tolerable distance range between said via holes and said

capacitors as a radius centering around said via holes with respect to the spacing between said power planes and said ground planes;

a capacitor check step of checking to see if said capacitors are present within said circle; and

a warning generation step of generating a warning if the capacitors are not present within said circle.

15. A printed circuit wiring board design method comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a via hole extraction step of extracting via holes for interconnecting wiring extending at different levels to each other across said power planes and said ground planes;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a circle creation step of creating a circle with the upper limit of a tolerable distance range between said via holes and said capacitors as a radius centering around said via holes with respect to

the spacing between said power planes and said ground planes;

a capacitor number check step of counting the number of said capacitors within said circle to compare the counted number thereof to the number of capacitors required for the upper limit of the tolerable distance range; and

a warning generation step of generating a warning if the capacitors within said circle do not meet the required number.

16. A printed circuit wiring board design method comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a power source pin extraction step of extracting power source pins for an integrated circuit mounted on said printed circuit board;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a measurement step of measuring the distance between said power source pins and said capacitors;

a distance comparison step of comparing measurement

distance between said power source pins and said capacitors, which is measured by said measurement part, to the upper limit of a tolerable distance range between said power source pins and said capacitors with respect to the spacing between said power planes and said ground planes; and

a warning generation step of generating a warning if said measurement distance is larger than the upper limit of said tolerable distance range.

17. The printed circuit wiring board design method according to claim 16,

wherein the upper limit of said tolerable distance range is displayed as a table.

18. The printed circuit wiring board design method according to claim 16,

wherein the upper limit of said tolerable distance range is displayed as a mathematical formula.

19. A printed circuit wiring board design method comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position

data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a power source pin extraction step of extracting power source pins for an integrated circuit mounted on said printed circuit board;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a circle creation step of creating a circle with the upper limit of a tolerable distance range between said power source pins and said capacitors as a radius centering around said power source pins with respect to the spacing between said power planes and said ground planes;

a capacitor check step of checking to see if said capacitors are present within said circle; and

a warning generation step of generating a warning if the capacitors are not present within said circle.

20. A printed circuit wiring board design method comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which

are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a power source pin extraction step of extracting power source pins for an integrated circuit mounted on said printed circuit board;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a circle creation step of creating a circle with the upper limit of a tolerable distance range between said power source pins and said capacitors as a radius centering around said power source pins with respect to the spacing between said power planes and said ground planes;

a capacitor capacitance check step of checking to see if the total of capacitance values of all capacitors present within said circle exceeds a reference value; and

a warning generation step of generating a warning if the total of said capacitance values does not exceed said reference value.

21. A printed circuit wiring board design program comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which

are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a via hole extraction step of extracting via holes for interconnecting wiring extending at different levels to each other across said power planes and said ground planes;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a measurement step of measuring the distance between said via holes and said capacitors;

a distance comparison step of comparing the upper limit of a tolerable distance range between said via holes and said capacitors to measurement distance between said via holes and said capacitors, which is measured by said measurement part, with respect to the spacing between said power planes and said ground planes; and

a warning generation step of generating a warning if said measurement distance is larger than the upper limit of said tolerable distance range.

22. The printed circuit wiring board design program according to claim 21,

wherein the upper limit of said tolerable distance range is displayed as a table.

23. The printed circuit wiring board design program according to claim 21,

wherein the upper limit of said tolerable distance range is displayed as a mathematical formula.

24. A printed circuit wiring board design program comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a via hole extraction step of extracting via holes for interconnecting wiring extending at different levels to each other across said power planes and said ground planes;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a circle creation step of creating a circle with the upper limit of a tolerable distance range between said via holes and said capacitors as a radius centering around said via holes with respect to the spacing between said power planes and said ground planes;

a capacitor check step of checking to see if said capacitors are present within said circle; and

a warning generation step of generating a warning if the

capacitors are not present within said circle.

25. A printed circuit wiring board design program comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a via hole extraction step of extracting via holes for interconnecting wiring extending at different levels to each other across said power planes and said ground planes;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a circle creation step of creating a circle with the upper limit of a tolerable distance range between said via holes and said capacitors as a radius centering around said via holes with respect to the spacing between said power planes and said ground planes;

a capacitor number check step of counting the number of said capacitors within said circle to compare the counted number thereof to the number of capacitors required for the upper limit of the tolerable distance range; and

a warning generation step of generating a warning if the capacitors within said circle do not meet the required number.

26. A printed circuit wiring board design program comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a power source pin extraction step of extracting power source pins for an integrated circuit mounted on said printed circuit board;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a measurement step of measuring the distance between said power source pins and said capacitors;

a distance comparison step of comparing measurement distance between said power source pins and said capacitors, which is measured by said measurement part, to the upper limit of a tolerable distance range between said power source pins and said capacitors with respect to the spacing between said power planes and said ground planes; and

a warning generation step of generating a warning if said measurement distance is larger than the upper limit of said tolerable distance range.

27. The printed circuit wiring board design program according to claim 26,

wherein the upper limit of said tolerable distance range is displayed as a table.

28. The printed circuit wiring board design program according to claim 26,

wherein the upper limit of said tolerable distance range is displayed as a mathematical formula.

29. A printed circuit wiring board design program comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a power source pin extraction step of extracting power source

pins for an integrated circuit mounted on said printed circuit board;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a circle creation step of creating a circle with the upper limit of a tolerable distance range between said power source pins and said capacitors as a radius centering around said power source pins with respect to the spacing between said power planes and said ground planes;

a capacitor check step of checking to see if said capacitors are present within said circle; and

a warning generation step of generating a warning if the capacitors are not present within said circle.

30. A printed circuit wiring board design program comprising, in order to design a printed circuit board including signal wiring, power planes, and ground planes:

a layout data input step of inputting layout data including structure data of said signal wiring, structure data of said power planes, structure data of said ground planes, spacing data between said power planes and said ground planes, and mounting position data of at least one of an active element and a passive element which are mounted on said printed circuit board;

a plane structure extraction step of extracting the structure of said power planes and said ground planes;

a power source pin extraction step of extracting power source pins for an integrated circuit mounted on said printed circuit board;

a capacitor extraction step of extracting capacitors connected between said power planes and said ground planes;

a circle creation step of creating a circle with the upper limit of a tolerable distance range between said power source pins and said capacitors as a radius centering around said power source pins with respect to the spacing between said power planes and said ground planes;

a capacitor capacitance check step of checking to see if the total of capacitance values of all capacitors present within said circle exceeds a reference value; and

a warning generation step of generating a warning if the total of said capacitance values does not exceed said reference value